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2131

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/015,247

Applicant(s)

LEUNG ET AL.

Examiner

Michael A. Cervone

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 and 40-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-38 and 40-82 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is in response to the amendment filed on September 6, 2006. The original application contained claims 1-82. Per the received amendment, claims 37, 40, and 73-75 have been amended and claim 39 has been cancelled. Presently pending claims are 1-38 and 40-82.

2. As mentioned in the previous action, the status identifier of claim 76 is incorrect. A second notice of non-compliant amendment has been submitted due to the fact that the status identifier of claim 76 is (Previously Amended) where it should be (Original).

Response to Arguments

3. Applicant's arguments with respect to claims 1-38 and 40-82 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4, 13-16, 44-46, 52, 54-57, 67-69 and 77-79 are rejected under 35 U.S.C. 102(e) as being anticipated by Khalil et al. (WO 01/26322).

6. As per claim 1, Khalil is directed to a method of registering a Mobile Node in a Mobility Agent supporting Mobile IP comprising:

- a. Receiving a Mobile IP registration request packet from the mobile node, indicating that a key to be shared by the mobile node and an agent with which the mobile node is registering is requested, wherein the agent with which the Mobile Node is registering is a Home Agent. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14]
- b. Obtaining a key to be shared by the mobile node and the agent with which the mobile node is registering. [See Page 13, lines 14-19]
- c. Storing the key to be shared by the mobile node and the agent with which the mobile node is registering. [See Page 13, lines 14-19 and Page 14, lines 1-4]
- d. Sending a Mobile IP registration reply packet to the mobile node including the key to be shared by the mobile node and the agent with which the mobile node is registering. [See Page 13, lines 20-30]

7. Claims 67-69 are "system", "computer-readable medium", and "apparatus" claims analogous to "method" claim 1. Claims 67-69 are rejected based on the same rationale as the rejection of claim 1.

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8. As per claim 2, Khalil is applied as stated in the rejection of claim 1. Khalil further teaches creating a registration entry for the mobile node in a mobility binding table (database). [See Page 14, lines 1-4]

9. As per claim 3, Khalil is applied as stated in the rejection of claim 1. Khalil further teaches that obtaining a key to be shared by the mobile node and the agent with which the mobile node is registering comprises:

a. Composing a request packet including authentication information associated with the mobile node and key request indicating that a key to be shared by the mobile node and the agent with which the mobile node is registering is requested. [See Page 12, lines 17-22 and Page 14, lines 12-18]

b. Sending the request packet to a network device (AAA server) adapted for authenticating the mobile node. [See Page 18, lines 13-22]

c. Receiving a reply packet from the network device in response to the key request, the reply packet including a key to be shared by the mobile node and the agent with which the mobile node is registering. [See Page 18, line 13 – Page 19, line 23]

10. As per claim 4, Khalil is applied as stated in the rejection of claim 3. Khalil further teaches that the network device (Home AAA server) is on a home network associated with the mobile node and the mobility agent is on a foreign network to which the mobile node has roamed. [See Page 17, lines 7-21]

11. As per claim 44, Khalil is directed to method of registering a mobile node in a mobility agent supporting mobile IP comprising:

- a. Receiving a Mobile IP registration request packet from the mobile node, indicating that a home agent with which the mobile node is to register is to be assigned to the mobile node. [See Page 19, lines 3-11].
- b. Obtaining a home agent assignment, the home agent assignment identifying the home agent with which the mobile node is to register. [See Page 19, lines 12- 23, and Page 20, lines 3-16]
- c. Sending a Mobile IP registration reply packet to the mobile node identifying the home agent with which the mobile node is to register. [See Page 19, lines 24-28 and Page 20, lines 3-16]

12. Claims 77-79 are “system”, “computer-readable medium”, and “apparatus” claims analogous to “method” claim 44. Claims 77-79 are rejected based on the same rationale as the rejection of claim 44.

13. As per claim 45, Khalil is applied as stated in the rejection of claim 44. Khalil further teaches creating a registration entry for the mobile node in a mobility binding table (database). [See Page 14, lines 1-4]

14. As per claim 46, Khalil is applied as stated in the rejection of claim 44. Khalil further teaches that wherein obtaining a home agent assignment comprises:

- a. Composing a request packet including authentication information associated with the mobile node and indicating that a home agent with which the mobile node is registering is to be assigned to the mobile node. [See Page 19, lines 3-11]
- b. Sending the request packet to a network device adapted for authenticating the mobile node. [See Page 19, lines 12- 23, and Page 20, lines 3-16]
- c. Receiving a reply packet from the network device, the reply packet identifying the home agent with which the mobile node is registering. [See Page 19, lines 24-28 and Page 20, lines 3-16]

15. As per claim 52, Khalil is applied as stated in the rejection of claim 44. Khalil further teaches that the Mobile IP registration reply packet further includes a key to be shared by the mobile node and the home agent with which the mobile node is registering. [See Page 13, lines 20-30]

16. As per claims 13 and 54, Khalil is applied as stated in the rejection of claims 3 and 52, respectively. Khalil further teaches that the reply packet including a first key to be provided to the agent with which the mobile node is registering and a second key to be provided to the mobile node, wherein the first key and the second key are each the

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key to be shared by the mobile node and the agent with which the mobile node is registering [See Page 13, lines 20-30 and Page 14, lines 5-11].

17. As per claims 14 and 55, Khalil is applied as stating in the rejection of claims 13 and 54, respectively. Khalil further teaches obtaining the second key to be provided to the mobile node from the reply packet and composing the Mobile IP registration reply packet, the Mobile IP registration reply packet comprising the second key to be provided to the mobile node [See Page 13, lines 20-30 and Page 14, lines 5-11].

18. As per claims 15 and 56, Khalil is applied as stated in the rejection of claims 14 and 55, respectively. Khalil further teaches that the Mobile IP registration reply packet further comprises a hash of the Mobile IP registration reply packet using the first key to be provide to the agent, the hash of the Mobile IP registration reply packet being provided in a first extension to the Mobile IP registration reply packet and the second key being provided in a second extension to the Mobile IP registration reply packet [See Page 13, lines 20-30 and Page 14, lines 5-11].

As per claims 16 and 57, Khalil is applied as stated in the rejection of claims 13 and 54, respectively. Khalil further teaches the agent is a mobility agent further comprising decrypting and storing the first key to be provided to the agent [See Page 13, lines 14-30 and Page 14, lines 1-4].

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Claim Rejections - 35 USC § 103

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. Claims 37, 38, 40, 41 and 73-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chowdhury et al. (US 2002/0114323) in view of Khalil et al. (WO 01/26322).

21. As per claim 37, Chowdhury is directed to a method of registering a mobile node with an agent supporting mobile IP comprising

- i. Composing a first Mobile IP registration request (MIP RRQ) that requests that a home agent be dynamically assigned to the mobile node.
[See 0027]
- ii. Sending (transmitting) the first Mobile IP registration request (MIP RRQ) to a mobility agent supporting mobile IP. [See 0027 and 0033.
Sends it to the PDSN then the PDSN sends it to the mobility agent.]
- iii. Receiving a registration reply (MIP Registration Reply) from the mobility agent, the registration reply identifying a home agent that has been assigned to the mobile node. [See 0035]

Chowdhury further teaches an MS/MN-HA Security Association phase discussing the exchange of keys, but fails to get into detail on the exchange [See 0034]. Khalil is

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directed to a method for registering and authenticating mobile nodes which teaches that the Mobile IP registration reply further identifies a key to be shared by the mobile node and the home agent that has been assigned to the mobile node, thereby enabling the mobile node to subsequently register directly with the home agent that has been assigned to the mobile node [See Page 13, lines 20-30]. Chowdhury and Khalil are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious to one skilled in the art to transmit a key as described in Khalil in order to provide the MS/MN-HA Security Association phase as described by Chowdhury [See 0034].

22. Claims 73-75 are "system", "computer-readable medium", and "apparatus" claims analogous to "method" claim 37. Claims 73-75 are rejected based on the same rationale as the rejection of claim 37.

23. As per claim 38, Chowdhury and Khalil are applied as stated in the rejection of claim 37. Chowdhury further teaches sending a second registration request (re-registration) to the home agent that has been assigned to the mobile node. [See 0035]

24. As per claim 40, Chowdhury and Khalil are applied as stated in the rejection of claim 37. Khalil further teaches:

- a. Obtaining the key to be shared by the mobile node and the home agent that has been assigned to the mobile node from the Mobile IP registration reply. [See Page 13, lines 20-30]
- b. Composing a second Mobile IP registration request including the key to be shared by the mobile node and the home agent that has been assigned to the mobile node. [See Page 11, lines 23-25. All communications thereafter are encrypted with the key]
- c. Sending the second Mobile IP registration request to the home agent that has been assigned to the mobile node. [See Page 11, lines 23-25. All communications thereafter are encrypted with the key].

Chowdhury and Khalil are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious to one skilled in the art to transmit a key as described in Khalil in order to provide the MS/MN-HA Security Association phase as described by Chowdhury [See 0034].

25. As per claim 41, Chowdhury and Khalil are applied as stated in the rejection of claim 37. Chowdhury teaches an MS/MN-HA Security Association phase discussing the exchange of keys, but fails to get into detail on the exchange [See 0034]. Khalil teaches that the registration request further indicates that a key to be shared by the mobile node and the home agent be generated. [See Page 13, lines 20-30]

Chowdhury and Khalil are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious to one skilled in the art to

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generate and transmit a key as described in Khalil in order to provide the MS/MN-HA Security Association phase as described by Chowdhury [See 0034].

26. Claims 5, 12, 18-27, 32-35, 36, 47, 48, 53, 59-63 and 70-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khalil et al. (WO 01/26322) in view of Chowdhury et al. (US 2002/0114323).

27. As per claim 5, Khalil is applied as stated in the rejection of claim 3. Khalil teaches the use of an AAA server [See Page 16, lines 23-29], but fails to teach the usage of a RADIUS access request packet. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the network device is a AAA server, wherein the request packet including the authentication information and the key request is a RADIUS access request packet, the RADIUS access request packet including an authentication attribute having the authentication information and a key request attribute having the key request. [See 0020 and 0034]. Khalil and Chowdhury are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious to one skilled in the art to use an AAA server as well as a RADIUS access request packet as described by Chowdhury in assigning a home agent as described by Khalil. The usage of the AAA server and the RADIUS protocol would increase the security capabilities of Khalil's system.

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28. As per claim 6, Khalil is applied as stated in the rejection of claim 3. Khalil is applied as stated in the rejection of claim 3. Khalil teaches the use of an AAA server [See Page 16, lines 23-29] and that the reply packet includes the key to be shared by the Mobile Node and the agent with which the Mobile Node is registering [See Page 13, lines 20-30], but fails to teach the usage of a RADIUS access request and accept packets. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the network device is a AAA server, wherein the reply packet is a RADIUS access accept packet [See 0020 and 0034]. Khalil and Chowdhury are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious to one skilled in the art to use an AAA server as well as a RADIUS access request packet as described by Chowdhury in assigning a home agent as described by Khalil. The usage of the AAA server and the RADIUS protocol would increase the security capabilities of Khalil's system.

29. As per claims 12 and 53, Khalil is applied as stated in the rejection of claims 1 and 52, respectively. Khalil fails to teach that the Mobile IP registration reply packet indicates that the mobile node needs to re-register. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the Mobile IP registration reply packet indicates that the mobile node needs to re-register with the agent with the key to be shared by the mobile node and the agent with which the mobile node is registering. [See 0034-0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious

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to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users, the usage of dynamic assignment can solve these issues. [See 0002-0003]. Furthermore, it is obvious to one skilled in the art to re-register a mobile node when the lifetime of the node expires if one wants to continue to communicate with it.

30. As per claim 18 and 36, Khalil is applied as stated in the rejection of claims 1 and 26, respectively. Khalil fails to teach the agent with which the mobile node is registering is a home agent to be dynamically assigned to the mobile node. Chowdhury is directed to a method for dynamically assigning a home agent that teaches the agent with which the mobile node is registering is a home agent to be dynamically assigned to the mobile node [See 0005]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users, the usage of dynamic assignment can solve these issues [See 0002-0003].

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31. As per claim 19, Khalil is applied as stated in the rejection of claim 1. Khalil fails to teach that the registration request packet indicates that the agent with which the mobile node is registering is a home agent to be dynamically assigned to the mobile node and the registration reply packet identifies that agent with which the mobile node is registering. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the Mobile IP registration request packet (MIP RRQ) indicates that the agent with which the mobile node is registering is a home agent to be dynamically assigned to the mobile node [See 0027] and the registration reply packet (MIP Registration Reply) identifies that agent with which the mobile node is registering [See 0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users the usage of dynamic assignment can solve these issues [See 0002-0003].

32. As per claim 20, Khalil and Chowdhury are applied as stated in the rejection of claims 19. Chowdhury further teaches the registration reply packet (MIP Registration Reply) further indicates that the agent is to be used by the mobile node in subsequent registration requests (re-registration requests) [See 0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between

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wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users the usage of dynamic assignment can solve these issues [See 0002-0003].

33. As per claim 21, Khalil and Chowdhury are applied as stated in the rejection of claim 19. Chowdhury further teaches the Mobile IP registration reply packet (MIP Registration Reply) indicates that the mobile node is to obtain the agent from the Mobile IP registration reply packet (MIP Registration Reply) [See 0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users the usage of dynamic assignment can solve these issues [See 0002-0003].

34. As per claim 22, Khalil and Chowdhury are applied as stated in the rejection of claim 19. Chowdhury further teaches the agent is a home agent on a network to which the mobile node has roamed [See 0032]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described

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by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users the usage of dynamic assignment can solve these issues [See 0002-0003].

35. As per claim 23, Khalil and Chowdhury are applied as stated in the rejection of claim 19. Chowdhury further teaches that the Mobile IP registration reply packet indicates that the mobile node needs to re-register with the agent with the key [See 0034-0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users the usage of dynamic assignment can solve these issues [See 0002-0003].

36. As per claim 24, Khalil and Chowdhury are applied as stated in the rejection of claim 23. Khalil further teaches:

- d. Receiving a second Mobile IP registration request from the mobile node, the second Mobile IP registration request being addressed to the agent with which the mobile node is registering. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14. All communications thereafter are encrypted with the key]

- e. Appending a key reply extension to the second Mobile IP registration request, the key reply extension including the key. [See Page 13, lines 20-30]
- f. Forwarding the second Mobile IP registration request to the agent with which the mobile node is registering. [See Page 13, lines 20-30]

37. As per claim 25, Khalil and Chowdhury are applied as stated in the rejection of claim 24. Khalil further teaches:

- g. Receiving a second Mobile IP registration reply from the agent with which the mobile node is registering. [See Page 11, lines 23-25. All communications thereafter are encrypted with the key]
- h. Removing the key to be shared by the mobile node and the agent with which the mobile node is registering from storage. [See Page 13, lines 20-30]
- i. Forwarding the second Mobile IP registration reply to the mobile node. [See Page 13, lines 20-30]

38. As per claim 26, Khalil is directed to a method of registering a mobile node with an agent supporting mobile IP, comprising:

- a. Composing a Mobile IP registration request having a key request extension requesting a key to be shared by the mobile node and the agent with which the mobile node is registering. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14].

- b. Sending the Mobile IP registration request to a mobility agent supporting mobile IP. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14].
- c. Obtaining the key to be shared by the mobile node and the agent with which the mobile node is registering from the key reply extension of the Mobile IP registration reply. [See Page 13, lines 14-19]
- d. Storing the key to be shared by the mobile node and the agent with which the mobile node is registering, thereby enabling the mobile node to subsequently register directly with the agent. [See Page 13, lines 14-19 and Page 14, lines 1-4].

Khalil fails to teach the need for the node to re-register with the agent. Chowdhury is directed to a method for dynamically assigning a home agent that teaches receiving a Mobile IP registration reply from the mobility agent, the Mobile IP registration reply indicating that the mobile node needs to re-register with the agent with which the mobile node is registering and having a key reply extension including the key to be shared by the mobile node and the agent with which the mobile node is registering, wherein the agent with which the Mobile node is registering is a Home Agent. [See 0035. Examiner asserts that the re-registration process is the same as the registration process, thus the key would be obtained the same way.] Khalil and Chowdhury are analogous art because they are both directed to methods for mobile IP registration and communication. It is obvious to one skilled in the art to re-register a mobile node when the lifetime of the node expires if one wants to continue to communicate with it.

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39. Claims 70-72 are "system", "computer-readable medium", and "apparatus" claims analogous to "method" claim 26. Claims 70-72 are rejected based on the same rationale as the rejection of claim 26.

40. As per claim 27, Khalil and Chowdhury are applied as stated in the rejection of claim 26. Khalil further teaches that the agent with which the mobile node is registering is the mobility agent. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14].

41. As per claim 32, Khalil and Chowdhury are applied as stated in the rejection of claim 26. Khalil fails to teach further teaches sending a subsequent Mobile IP registration request to the agent including a value associated with the key to be shared by the mobile node and the agent with which the mobile node is registering. Chowdhury is directed to a method for dynamically assigning a home agent that teaches sending a subsequent registration request to the agent including a value associated with the key to be shared by the mobile node and the agent with which the mobile node is registering [See 0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use the re-registration request as described by Chowdhury in the assignment of a home agent as described by Khalil. It is known in the art to re-register a node should the connection fail or the key expire.

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42. As per claim 33, Khalil and Chowdhury are applied as stated in the rejection of claim 32. Khalil further teaches that the subsequent Mobile IP registration request comprises an authentication extension including a hash value of the key to be shared by the mobile node and the agent with which the mobile node is registering [See Page 13, lines 20-30 and Page 14, lines 5-11].

43. As per claim 34, Khalil and Chowdhury are applied as stated in the rejection of claim 26. Khalil further teaches that the Mobile IP registration reply further comprises an authentication extension comprising:

Authenticating the Mobile IP registration reply using the authentication extension and the key to be shared by the mobile node and the agent with which the mobile node is registering, thereby verifying that the mobile node and the agent with which the mobile node is registering both share the key to be shared by the mobile node and the agent with which the mobile node is registering [See Page 12, lines 17-22 and Page 14, lines 12-18]

44. As per claim 35. Khalil and Chowdhury are applied as stated in the rejection of claim 26. Khalil further teaches that the agent with which the mobile node is registering is the home agent on a network to which the mobile node has roamed. [See Page 17, lines 7-21]

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45. As per claim 47, Khalil is applied as stated in the rejection of claim 46. Khalil teaches the use of an AAA server [See Page 16, lines 23-29], but fails to teach the usage of a RADIUS access request packet. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the network device is an AAA server, wherein the request packet is a RADIUS access request packet, the RADIUS access request packet including an authentication attribute having the authentication information and an attribute indicating that a home agent is to be assigned to the mobile node [See 0020 and 0034]. It is obvious to one skilled in the art to use an AAA server as well as a RADIUS access request packet as described by Chowdhury in assigning a home agent as described by Khalil. The usage of the AAA server and the RADIUS protocol would increase the security capabilities of Khalil's system.

46. As per claim 48, Khalil is applied as stated in the rejection of claim 46. Khalil teaches the use of an AAA server [See Page 16, lines 23-29], but fails to teach the usage of a RADIUS access request packet. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the network device is an AAA server, wherein the reply packet is a RADIUS access accept packet, the RADIUS access accept packet identifying the home agent [See 0020 and 0034]. It is obvious to one skilled in the art to use an AAA server as well as a RADIUS access request packet as described by Chowdhury in assigning a home agent as described by Khalil. The usage of the AAA server and the RADIUS protocol would increase the security capabilities of Khalil's system.

47. As per claim 59, Khalil is applied as stated in the rejection of claim 44. Khalil fails to teach that the Mobile IP registration reply packet further indicates that the home agent is to be used by the mobile node in subsequent registration requests. Chowdhury is directed to a method for dynamically assigning a home agent that teaches the Mobile IP registration reply packet further indicates that the home agent is to be used by the mobile node in subsequent registration requests (re-registration requests) [See 0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use the re-registration request as described by Chowdhury in the assignment of a home agent as described by Khalil. It is known in the art to re-register a node should the connection fail or the key expire.

48. As per claim 60, Khalil is applied as stated in the rejection of claim 44. Khalil fails to teach that the Mobile IP registration reply packet indicates that the mobile node is to identify the home agent from the Mobile IP registration reply packet. Chowdhury is directed to a method for dynamically assigning a home agent that teaches the Mobile IP registration reply packet indicates that the mobile node is to identify the home agent from the Mobile IP registration reply packet [See 0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use dynamic assignment as described by Chowdhury in assigning a home agent as described by Khalil. Static

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assignment of home agents can result in an inefficient use of resources and a possible degradation in services provided to the mobile users the usage of dynamic assignment can solve these issues [See 0002-0003].

49. As per claim 61, Khalil is applied as stated in the rejection of claim 52. Khalil fails to teach re-registration. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the Mobile IP registration reply packet indicates that the mobile node needs to re-register with the home agent with the key [See 0034-0035]. Khalil and Chowdhury are analogous art because they are both directed to methods for communications between wireless devices. It is obvious to one skilled in the art to use the re-registration request as described by Chowdhury in the assignment of a home agent as described by Khalil. It is known in the art to re-register a node should the connection fail or the key expire.

50. As per claim 62, Khalil and Chowdhury are applied as stated in the rejection of claim 61. Khalil further teaches:

- j. Receiving a second Mobile IP registration request from the mobile node, the second Mobile IP registration request being addressed to the agent with which the mobile node is registering. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14. All communications thereafter are encrypted with the key]
- k. Appending a key reply extension to the second registration request, the key reply extension including the key. [See Page 13, lines 20-30]

- I. Forwarding the second Mobile IP registration request to the agent with which the mobile node is registering. [See Page 13, lines 20-30]

51. As per claim 63, Khalil and Chowdhury are applied as stated in the rejection of claim 62. Khalil further teaches:

- m. Receiving a second Mobile IP registration reply from the home agent with which the mobile node is registering. [See Page 11, lines 23-25. All communications thereafter are encrypted with the key]
- n. Removing the key to be shared by the mobile node and the home agent with which the mobile node is registering from storage. [See Page 13, lines 20-30]
- o. Forwarding the second Mobile IP registration reply to the mobile node. [See Page 13, lines 20-30]

52. Claims 42, 64-65, 76 and 80-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khalil et al. (WO 01/26322) in view of Agraharam et al. (US 6,407,988).

53. As per claim 42, Khalil is directed to a method of authenticating a registration request associated with a mobile node in a network device for performing authentication of a mobile node comprising

- d. Receiving a request packet including authentication information associated with the mobile node and indicating that a home agent is to be assigned to the mobile node. [See Page 12, lines 17-22 and Page 14, lines 12-18]
- e. Authenticating the mobile node using the authentication information [See Page 18, lines 13-22].
- f. Assigning a home agent to the mobile node [See Page 18, line 13 – Page 19, line 23].
- g. Sending a reply packet identifying the home agent assigned to the mobile node. [See Page 18, line 13 – Page 19, line 23]

Khalil fails to teach the home agent being located on a foreign network that the mobile node is visiting. Agraharam is directed to a method for providing a temporary home agent (pseudo home agent) on a foreign network which teaches the home agent being located on a foreign network that the mobile node is visiting [See Col. 5, line 20 – Col. 6, line 33]. Khalil and Agraharam are analogous art because they are both directed to communications throughout Mobile IP networks. It is obvious to one skilled in the art to allow a home agent to be located on a foreign network in order to provide “enhanced privacy features to mobile hosts and conserve resources of the networks that carry data to the mobile hosts” [See Col. 1, lines 43-46].

54. Claim 76 is a “system” claim analogous to “method” claim 42. Claim 76 is rejected based on the same rationale as the rejection of claim 42.

55. As per claim 64, Khalil is directed to a method of registering a mobile node in a mobility agent supporting mobile IP, comprising:

- d. Receiving a Mobile IP registration request packet, the Mobile IP registration request packet having an extension including a key to be shared by the mobility agent and the mobile node. [See Page 11, lines 17-19, 23-25 and Page 13, line 11-14]
- e. Obtaining the key from the extension of the Mobile IP registration request packet. [See Page 13, lines 14-19]
- f. Storing the key, thereby enabling the mobile node to subsequently register directly with the mobility agent. [See Page 13, lines 14-19 and Page 14, lines 1-4]
- g. Authenticating the Mobile IP registration request packet using the key. [See Col. 18, lines 36-48]
- h. Composing a Mobile IP registration reply packet [See Page 13, lines 20-30]
- i. Sending the Mobile IP registration reply packet to the mobile node. [See Page 13, lines 20-30]

Khalil fails to teach the home agent being located on a foreign network that the mobile node has roamed. Agraharam is directed to a method for providing a temporary home agent (pseudo home agent) on a foreign network which teaches the home agent being located on a foreign network that the mobile node has roamed [See Col. 5, line 20 – Col. 6, line 33]. Khalil and Agraharam are analogous art because they are both

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directed to communications throughout Mobile IP networks. It is obvious to one skilled in the art to allow a home agent to be located on a foreign network in order to provide “enhanced privacy features to mobile hosts and conserve resources of the networks that carry data to the mobile hosts” [See Col. 1, lines 43-46].

56. Claims 80-82 are “system”, “computer-readable medium”, and “apparatus” claims analogous to “method” claim 64. Claims 80-82 are rejected based on the same rationale as the rejection of claim 64.

57. As per claim 65, Khalil and Agraharam are applied as stated in the rejection of claim 64. Khalil further teaches decrypting the key. [See Page 13, lines 20-30]

58. Claims 7-11, 17, 49-51 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khalil et al. (WO 01/26322) in view of Rai et al. (US Patent Number 6,421,714).

59. As per claims 7 and 49, Khalil is applied as stated in the rejection of claims 1 and 44, respectively. Khalil fails to teach that the mobility agent is adapted for functioning as both a home and foreign agent. Rai is directed to a Mobility management scheme which teaches that the mobility agent is adapted for functioning as a foreign agent and a home agent, and further comprising:

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- p. Sending an agent advertisement indicating that the mobility agent is configured for functioning as a home agent and a foreign agent. [See Col. 37 lines 35-43].

Khalil and Rai are analogous art because they are both directed to methods for communications between wireless devices. Agent advertisements delivered to mobile devices located in the vicinity of the agent are well known in the art. It is obvious to one skilled in the art to use the agent advertisements as described by Rai in order to send advertisements from access points to mobile nodes to inform them when they are in range of a home or foreign agent.

60. As per claims 8 and 50, Khalil and Rai are applied as stated in the rejection of claim 7 and 49, respectively. Rai further teaches that the agent advertisement further indicates an authentication domain (care-of-address) associated with the mobility agent. [See Col. 18 lines 19-64].

61. As per claim 9, Khalil and Rai are applied as stated in the rejection of claim 7. Rai further teaches that the agent advertisement further indicates that the mobile node should obtain an IP address (care-of-address) from a DHCP server (foreign agent). [See Col. 18 lines 19-64].

62. As per claim 10, Khalil and Rai are applied as stated in the rejection of claim 7. Rai further teaches that the agent advertisement further indicates that the mobile node

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should obtain an IP address (care-of-address) from the agent (foreign agent) with which the mobile node is registering. [See Col. 18 lines 19-64].

63. As per claims 11 and 51, Khalil and Rai are applied as stated in the rejection of claims 7 and 49, respectively. Rai further teaches that the agent advertisement further indicates that the mobile node should obtain an IP address (care-of-address) via the mobility agent (foreign agent). [See Col. 18 lines 19-64].

64. As per claims 17 and 58, Khalil is applied as stated in the rejection of claims 1 and 44, respectively. Khalil fails to teach the agent with which the mobile node is registering is a home agent on a network to which the mobile node has roamed. Rai is directed to a Mobility management scheme which teaches the agent with which the mobile node is registering is a home agent on a network to which the mobile node has roamed. [See Col. 37 lines 35-43]. Khalil and Rai are analogous art because they are both directed to methods for communications between wireless devices. Agents acting as home agents to its home mobile nodes and foreign agents to foreign mobile nodes is well known in the art. It is obvious to one skilled in the art to combine the registration abilities of Rai with the registration processes of Khalil.

65. Claims 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Khalil et al. (WO 01/26322) in view of Chowdhury et al. (US 2002/0114323) and in further view Rai et al. (US Patent Number 6,421,714).

66. As per claim 28, Khalil and Chowdhury are applied as stated in the rejection of claim 26. Khalil and Chowdhury fail to teach receiving an agent advertisement indicating an authentication domain associated with the mobility agent, determining whether the authentication domain associated with the mobility agent is different from that of the mobile node, wherein composing a registration request having a key request extension is performed when is determined that the authentication domain associated with the mobility agent is different from that of the mobile node. Rai is directed to a Mobility management scheme which teaches:

- q. Receiving an agent advertisement indicating an authentication domain (care-of-address) associated with the mobility agent. [See Col. 18 lines 19-64].
- r. Determining whether the authentication domain associated with the mobility agent is different from that of the mobile node. [See Col. 16 line 66 – Col. 17 line 22]
- s. Wherein composing a registration request having a key request extension is performed when is determined that the authentication domain associated with the mobility agent is different from that of the mobile node. [See Col. 16 line 66 – Col. 17 line 22]

Khalil and Rai are analogous art because they are both directed to methods for communications between wireless devices. Agent advertisements delivered to mobile devices located in the vicinity of the agent are well known in the art. It is obvious to one skilled in the art to use the agent advertisements as described by Rai in order to send

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advertisements from access points to mobile nodes to inform them when they are in range of a home or foreign agent.

67. As per claim 29, Khalil, Chowdhury and Rai are applied as stated in the rejection of claim 28. Rai teaches that the agent advertising further indicates that the mobile node should obtain an IP address (care-of-address) from a DHCP server (foreign agent), further comprising obtaining an IP address from a DHCP server. [See Col. 18 lines 19-64].

68. As per claim 30, Khalil, Chowdhury and Rai are applied as stated in the rejection of claim 28. Rai further teaches that the agent advertisement further indicates that the mobile node should obtain an IP address (care-of-address) from the mobility agent (foreign agent), further comprising obtaining an IP address from the mobility agent. [See Col. 18 lines 19-64].

69. As per claim 31, Khalil and Chowdhury are applied as stated in the rejection of claim 26. Khalil and Chowdhury fail to teach that the mobility agent is adapted for functioning as both a home and foreign agent. Rai is directed to a Mobility management scheme which teaches that the mobility agent is adapted for functioning as a foreign agent and a home agent, and further comprising:

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- t. Receiving an agent advertisement from the mobility agent indicating that the mobility agent is configured for functioning as a home agent and a foreign agent. [See Col. 37 lines 35-43].

Khalil and Rai are analogous art because they are both directed to methods for communications between wireless devices. Agent advertisements delivered to mobile devices located in the vicinity of the agent are well known in the art. It is obvious to one skilled in the art to use the agent advertisements as described by Rai in order to send advertisements from access points to mobile nodes to inform them when they are in range of a home or foreign agent.

70. Claim 66 is rejected under 35 U.S.C. 103(a) as being unpatentable over Khalil et al. (WO 01/26322) in view of Agraharam et al. (US 6,407,988) and in further view of Rai (US Patent Number 6,421,714).

71. As per claim 66, Khalil and Agraharam are applied as stated in the rejection of claim 64. Khalil and Agraharam fail to teach that the registration packet indicates an IP address is requested. Rai is directed to a Mobility management scheme which teaches that the registration request packet indicates that an IP address is requested, comprising:

- u. Assigning an IP address to the Mobile Node. [See Col. 9 line 61 – Col. 10 line 14]

- v. Wherein the registration reply packet includes the assigned IP address.

[See Col. 9 line 61 – Col. 10 line 14]

Khalil and Rai are analogous art because they are both directed to methods for communications between wireless devices. Including and IP address in the reply packet is well known in the art. It is obvious to include the IP address of Rai in the method of receiving a reply of Khalil in order to identify which agent the node is registered with and to keep track of the node.

72. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Khalil et al. (WO 01/26322) in view of Agraharam et al. (US 6,407,988) and further in view of Chowdhury et al. (US 2002/0114323).

73. As per claim 43, Khalil and Agraharam are applied as stated in the rejection of claim 42. Khalil teaches the use of an AAA server [See Page 16, lines 23-29], but fails to teach the usage of a RADIUS access request packet. Chowdhury is directed to a method for dynamically assigning a home agent that teaches that the network device is an AAA server, wherein the request packet is a RADIUS access request packet and wherein the reply packet is a RADIUS access reply packet [See 0020]. It is obvious to one skilled in the art to use an AAA server as well as a RADIUS access request packet as described by Chowdhury in assigning a home agent as described by Khalil. The usage of the AAA server and the RADIUS protocol would increase the security capabilities of Khalil's system.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Cervone whose telephone number is 571-272-3712. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 571-272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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